

## **Remarks**

Applicants thank the examiner for examining the present application and for finding that Claim 52 contains allowable subject matter.

With entry of this amendment, Claims 1, 2, 4-6, 8-10, 22, 24-27, 29-35, 37-39, 41-53, and 148-151 remain. Claims 28 and 36 have been canceled. Claims 11-21, 23, and 54-137 remain withdrawn as the result of an earlier restriction requirement.

Claim 1 has been amended to more clearly describe the aromatic species as the major binder by referring to it as the “aromatic binder.” Support for the amendment can be found, for example, at pg. 5, paragraph [0016], which says, “the present invention uses aromatic species as the major binder component in the feedstock.” Furthermore, currently amended Claim 1 adds the limitation that besides the aromatic binder, the feedstock comprises no additional binders in a total amount greater than approximately 10 vol%. Support for the amendment can be found for example at pg. 4, paragraph [0015], which says that additional binders are optional, and at pg. 8, Table 1, which shows that the feedstock can comprise polymer binders in an amount ranging between approximately 0% and approximately 10%. No new matter has been introduced.

Claims 4, 6, 8, 27, 38, and 43 have been amended to maintain proper antecedent basis according to the terminology used in currently amended Claim 1. No new matter has been introduced.

Claim 148 has been amended to add the limitation that the feedstock comprises less than approximately 40 vol% of the aromatic species. Support for the amendment can be found, for example, on pg. 5, paragraph [0016], which says, “the aromatic species can

comprise less than approximately 40% of the volume of the feedstock.” No new matter has been introduced.

By this amendment, new Claims 150 and 151 are submitted for consideration. Support for new Claim 150 can be found in the specification at, for example, pg. 4, paragraph [0015], which indicates that components in addition to the metal powder and aromatic binder are optional, and at pg. 8, Table 1, which shows that the feedstock need not comprise a supplementary polymer binder. Support for new Claim 151 can be found in the specification at, for example, pg. , paragraph [0018], which describes the use of a polymer binder in various amounts that are in the range of less than approximately 5 vol%. Additional claims can be found in original claims 34, 35, and 37, which describe the use of an additional binder in amounts that are less than approximately 5 vol%. No new matter has been introduced.

### **Response to Claim Rejections – 35 USC §102**

#### JP04116104 does not teach each and every element of currently-amended Claim 1:

The Examiner has rejected Claim 1 as being anticipated under 35 U.S.C. § 102(b) by JP04116104 (Office Action pg. 2). Applicants have amended Claim 1 in the interest of expediently obtaining a notice of allowance. However, Applicants believe that the Examiner’s rejection is improper. A proper anticipation rejection requires that a reference “teach every element of the claim” (see MPEP 2131). As discussed below, JP04116104 fails to teach all the features of Claim 1, and Claim 1 is properly allowable over JP04116104.

As previously presented, Claim 1 recited, in part, a composition comprising a metal powder and an aromatic binder system comprising an aromatic species. The specification at page 5, paragraph [0016] further describes the aromatic species as “the major binder component in the feedstock.” JP04116104 does not teach or suggest an aromatic species that is the binder. Instead, JP04116104 describes a sublimable substance and a separate binder. The sublimable substance does not serve as a binder but rather as a means to create pores in a molded body through which the binder can subsequently escape. That the sublimable substance is not a binder is further made clear by the fact that the sublimable substance is removed prior to sintering, which leaves the actual binder and the metal powder.

In contrast, the embodiments of the claimed invention rely on an aromatic binder and little or no additional binders. As described in the specification at page 4, paragraph [0014], the use of an aromatic species as the binder results in finished articles having minimal oxidation and little or no carbon and/or nitrogen residue since the aromatic binder can be easily removed and does not require burn-out in oxidizing environments. As described in the specification at page 5, paragraph [0016], traditional approaches can commonly use binders that include water, which oxidizes the metal during heating, or difficult-to-remove organics such as waxes and oils. JP04116104 does not teach that the binder is an aromatic species.

In spite of Applicants’ belief that the Examiner’s rejection is improper, in the interest of expediently putting the application in condition for allowance, Applicant has amended original Claim 1 to more clearly communicate the fact that the present invention utilizes an “aromatic binder” as the major binder and that little or no additional binders

are utilized. Currently amended Claim 1 now recites a limitation that the feedstock comprises “no additional binders in an amount totaling greater than approximately 10 vol%.” JP04116104 does not teach a feedstock having less than approximately 40 vol% of an aromatic binder and no additional binders in an amount totaling greater than approximately 10 vol%. Accordingly, Examiner’s rejection should be withdrawn and currently amended Claim 1 should be allowed. Applicants respectfully request such action.

JP06002011 does not teach each and every element of currently-amended Claim 148:

The Examiner also rejects Claim 148 as being anticipated under 35 USC §102(b) by JP06002011. Applicant has amended Claim 148 to include the limitation that the feedstock comprise “less than approximately 40 vol% of said aromatic binder.” JP06002011 does not teach a feedstock consisting of the same composition. Accordingly, currently-amended Claim 148 should be allowed and Applicants respectfully request such action. Applicants also request that dependent Claim 149 be allowed as it depends on currently-amended Claim 148, which is believed to be in condition for allowance.

**Response to Claim Rejections - 35 USC §103**

The Examiner has rejected Claims 6, 8-9, 50-51, 53, 27-39, and 41-49 under 35 USC §103(a) as being unpatentable over JP04116104 or over JP04116104 in view of either JP06-002011 or Hermann. Applicants believe that the Examiner has failed to establish a

prima facie case of obviousness for at least the following reasons, and the Examiner's rejections are traversed.

JP04116104 teaches away from the claimed invention:

As suggested elsewhere herein, JP04116104 teaches away from the Applicants' claimed invention because rather than an aromatic binder, it includes a "binder" and a "sublimable substance," wherein the binder serves to maintain the form of the molded body and the sublimable substance serves to create pores in the molded body through which the binder can escape during dewaxing and sintering. It, therefore, relies on a binder that is NOT a sublimable substance to maintain the integrity of the molded body.

The disclosure of JP04116104 teaches away from the use of an aromatic species as the actual binder, as claimed by the applicants. That the feedstock comprises an aromatic binder is significant in the present invention because Applicants have found that it results in finished articles having minimal oxidation and little or no carbon and/or nitrogen residue since the aromatic binder can be easily removed and does not require burn-out in oxidizing environments. Furthermore, Applicants specifically describe the negative effects of using waxes as binders in the specification at page 5, paragraph [0016]. In contrast to the Applicant's invention, the composition disclosed in JP04116104, describes "dewaxing" of the molded body, suggesting that the JP104116104 composition uses difficult-to-remove waxes as a binder. Furthermore, it is clear that the sublimable substance described in JP04116104 is not a binder because it is removed by vacuum treatment prior to dewaxing and sintering.

For at least these reasons, JP04116104 teaches away from the Applicants' claimed invention and is not properly combinable with ordinary skill in the art or with other references as a basis for a prima facie 103(a) rejection of the Applicants' claims. Accordingly, Claims 6, 8-9, 50-51, 53, 27-39, and 41-49 should be allowed and Applicants respectfully request such action.

Claims 2, 4-6, 8-10, 22, 24-27, 29-35, 37-39, and 150 are also allowable since they depend on currently-amended Claim 1:

The Examiner has rejected dependent Claims 2, 4-6, 8-10, 22, 24-27, 29-35, 37-39, 41-53, and 150 as being:

- 1) anticipated by JP04-116104 or JP06-002011, and/or
- 2) obvious over JP04-116104 or over JP04116104 in view of either JP06-002011 or Hermann.

However, the instant Claims should be allowed for at least the reason that they are dependent on currently amended Claim 1, which is believed to be allowable. Furthermore, Claims 2, 4-6, 8-10, 22, 24-27, 29-35, 37-39, 41-53, and 150 are each independently patentable because of the unique and nonobvious features of the combinations set forth in each claim. Accordingly, Applicants respectfully request that the instant claims be allowed by the Examiner.

Currently amended Claim 1 believed to be generic

As described above, Applicants believe currently amended Claim 1 to be in condition for allowance and respectfully request allowance of said claim. Furthermore,

Applicants believe Claim 1 to be generic. Accordingly, Applicants request consideration of Claims 11-21, and 23 for rejoinder under MPEP §809.02. Claims 11-21 and 23 are written in dependent form, having currently amended Claim 1 as their base claim, and include all the limitations of currently amended, generic Claim 1, which is believed to be in condition for allowance.

### Conclusion

For the reasons recited above, the application is believed to be in condition for allowance. Therefore, Applicants respectfully request that a timely Notice of Allowance be issued in this case. No additional claim fees are believed to be due. However, should such fees exist, or if any additional fees may be required in connection with filing this amendment and any extension of time, the Director is hereby authorized to charge our Deposit Account No. 02-1275.

Respectfully submitted,



Allan C. Tuan  
Reg. No. 55,689

Allan C. Tuan (K1-53)  
Intellectual Property Legal Services  
Battelle Memorial Institute  
Pacific Northwest National Laboratory  
P.O. Box 999  
Richland, WA 99352  
(509) 375-6866